

X25b Galactic formation and chemical evolution of dwarf galaxies in local groups explored by mass-metallicity relations

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There are extremely faint galaxies in the universe called dwarf spheroidal galaxies (dSphs). Generally dSphs do not have much interstellar gas, thought to have blown away by galactic scale winds. Therefore, they are often less star forming and dark matter dominated. The purpose of this study is to explore the history of star formation and chemical evolution of dwarf galaxies by examining the relationship between mass and metallicity in these dSph and other Local Group dwarf galaxies.

For dSphs, $[\text{Fe}/\text{H}]$ is almost the only metallicity indicator, and we adopted it in this study. $[\text{Fe}/\text{H}]$ is a measure of the metallicity of stellar species, and its dependence on the star formation history is generally different from that of $12 + \log(\text{O}/\text{H})$, which is a measure of the metallicity of the gas.

In this study, we calculated the virial mass and stellar mass, and explored their relationship to luminosity and metallicity. The main result is that the stellar mass-metallicity relation shows a similar correlation to larger galaxies than to dwarf galaxies. In addition, we found a negative correlation between the virial mass-luminosity relation. We will describe these details and other results. In addition, we will discuss the comparison of several galactic wind models with observations, and the timing of galactic winds inferred from the star formation history and orbital evolution of dwarf galaxies.